

=> d his

(FILE 'HOME' ENTERED AT 20:13:19 ON 05 NOV 2004)

INDEX 'ADISCTI, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, ANTE, AQUALINE, AQUASCI, BIOBUSINESS, BIOCOMMERCE, BIOENG, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA, CANCERLIT, CAPLUS, CEABA-VTB, CEN, CIN, CONFSCI, CROPB, CROPU, DDFB, DDFU, DGENE, DISSABS, ...' ENTERED AT 20:13:46 ON 05 NOV 2004

SEA (GERANYLGERANYL? (S)(SYNTHAS? OR SYNTHETAS?)) AND ((ABIETAD

-----  
13 FILE AGRICOLA  
3 FILE BIOENG  
29 FILE BIOSIS  
6 FILE BIOTECHABS  
6 FILE BIOTECHDS  
25 FILE BIOTECHNO  
15 FILE CABA  
5 FILE CANCERLIT  
42 FILE CAPLUS  
1 FILE CROPU  
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9 FILE DISSABS  
1 FILE DRUGB  
1 FILE DRUGU  
27 FILE EMBASE  
29 FILE ESBIODASE  
0\* FILE FEDRIP  
1 FILE FSTA  
2 FILE GENBANK  
4 FILE IFIPAT  
7 FILE JICST-EPLUS  
16 FILE LIFESCI  
26 FILE MEDLINE  
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9 FILE PASCAL  
39 FILE SCISEARCH  
12 FILE TOXCENTER  
40 FILE USPATFULL  
5 FILE USPAT2  
2 FILE WPIDS  
2 FILE WPINDEX

L1 QUE (GERANYLGERANYL? (S)(SYNTHAS? OR SYNTHETAS?)) AND ((ABIETAD

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FILE 'DGENE, CAPLUS, USPATFULL, SCISEARCH, BIOSIS, ESBIODASE, EMBASE, MEDLINE, BIOTECHNO, LIFESCI' ENTERED AT 20:18:49 ON 05 NOV 2004

L2 720 S (GERANYLGERANYL? (S)(SYNTHAS? OR SYNTHETAS?)) AND ((ABIETADIE  
L3 283 S L2 AND HMG?  
L4 282 DUP REM L3 (1 DUPLICATE REMOVED)  
L5 282 S L4 AND (PRODUC? OR SYNTHES?)  
L6 281 S L5 AND (MICROORGANISM? OR CELL? OR ORGANISM? OR YEAST? OR CE  
L7 1 S L6 AND UPC?

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PASSWORD:

TERMINAL (ENTER 1, 2, 3, OR ?):2

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NEWS 2 "Ask CAS" for self-help around the clock  
NEWS 3 JUL 12 BEILSTEIN enhanced with new display and select options,  
resulting in a closer connection to BABS  
NEWS 4 AUG 02 IFIPAT/IFIUDB/IFICDB reloaded with new search and display  
fields  
NEWS 5 AUG 02 CAPLUS and CA patent records enhanced with European and Japan  
Patent Office Classifications  
NEWS 6 AUG 02 The Analysis Edition of STN Express with Discover!  
(Version 7.01 for Windows) now available  
NEWS 7 AUG 27 BIOCOMMERCE: Changes and enhancements to content coverage  
NEWS 8 AUG 27 BIOTECHABS/BIOTECHDS: Two new display fields added for legal  
status data from INPADOC  
NEWS 9 SEP 01 INPADOC: New family current-awareness alert (SDI) available  
NEWS 10 SEP 01 New pricing for the Save Answers for SciFinder Wizard within  
STN Express with Discover!  
NEWS 11 SEP 01 New display format, HITSTR, available in WPIDS/WPINDEX/WPIX  
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NEWS 13 SEP 27 SWETSCAN will no longer be available on STN  
NEWS 14 OCT 28 KOREAPAT now available on STN

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MACINTOSH VERSION IS V6.0c(ENG) AND V6.0Jc(JP),  
AND CURRENT DISCOVER FILE IS DATED 11 AUGUST 2004  
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NEWS WWW CAS World Wide Web Site (general information)

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FILE 'HOME' ENTERED AT 20:13:19 ON 05 NOV 2004

=> index bioscience medicine

FILE 'DRUGMONOG' ACCESS NOT AUTHORIZED

COST IN U.S. DOLLARS

SINCE FILE	TOTAL
ENTRY	SESSION
0.21	0.21

FULL ESTIMATED COST

INDEX 'ADISCTI, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, ANTE, AQUALINE,  
AQUASCI, BIOBUSINESS, BIOCOMMERCE, BIOENG, BIOSIS, BIOTECHABS, BIOTECHDS,  
BIOTECHNO, CABA, CANCERLIT, CAPLUS, CEABA-VTB, CEN, CIN, CONFSCI, CROPB,  
CROPU, DDFB, DDFU, DGENE, DISSABS, ...' ENTERED AT 20:13:46 ON 05 NOV 2004

78 FILES IN THE FILE LIST IN STNINDEX

Enter SET DETAIL ON to see search term postings or to view  
search error messages that display as 0\* with SET DETAIL OFF.

```
=> s (geranylgeranyl? (s)(synthas? or synthetas?) and ((abietadien? or
diterpen?)(s)(synthas? or synthetas?))
UNMATCHED LEFT PARENTHESIS '(GERANYLGER'
The number of right parentheses in a query must be equal to the
number of left parentheses.
```

```
=> s (geranylgeranyl? (s)(synthas? or synthetas?)) and ((abietadien? or
diterpen?)(s)(synthas? or synthetas?))
```

```
13 FILE AGRICOLA
3 FILE BIOENG
29 FILE BIOSIS
6 FILE BIOTECHABS
6 FILE BIOTECHDS
25 FILE BIOTECHNO
15 FILE CABA
5 FILE CANCERLIT
42 FILE CAPLUS
1 FILE CROPU
1 FILE DDFB
1 FILE DDFU
26 FILES SEARCHED...
447 FILE DGENE
9 FILE DISSABS
1 FILE DRUGB
1 FILE DRUGU
27 FILE EMBASE
29 FILE ESBIODASE
0* FILE FEDRIP
1 FILE FSTA
2 FILE GENBANK
4 FILE IFIPAT
7 FILE JICST-EPLUS
16 FILE LIFESCI
26 FILE MEDLINE
2 FILE NTIS
53 FILES SEARCHED...
9 FILE PASCAL
39 FILE SCISEARCH
12 FILE TOXCENTER
40 FILE USPATFULL
5 FILE USPAT2
2 FILE WPIDS
73 FILES SEARCHED...
2 FILE WPINDEX
```

32 FILES HAVE ONE OR MORE ANSWERS, 78 FILES SEARCHED IN STNINDEX

```
L1 QUE (GERANYLGERANYL? (S)(SYNTHAS? OR SYNTHETAS?)) AND ((ABIETADIEN? OR DIT
ERPEN?)(S)(SYNTHAS? OR SYNTHETAS?))
```

```
=> d rank
```

```
F1 447 DGENE
F2 42 CAPLUS
F3 40 USPATFULL
F4 39 SCISEARCH
F5 29 BIOSIS
F6 29 ESBIODASE
F7 27 EMBASE
F8 26 MEDLINE
F9 25 BIOTECHNO
F10 16 LIFESCI
F11 15 CABA
F12 13 AGRICOLA
F13 12 TOXCENTER
F14 9 DISSABS
F15 9 PASCAL
F16 7 JICST-EPLUS
F17 6 BIOTECHABS
F18 6 BIOTECHDS
F19 5 CANCERLIT
```

F20	5	USPAT2
F21	4	IFIPAT
F22	3	BIOENG
F23	2	GENBANK
F24	2	NTIS
F25	2	WPIDS
F26	2	WPINDEX
F27	1	CROPU
F28	1	DDFB
F29	1	DDFU
F30	1	DRUGB
F31	1	DRUGU
F32	1	FSTA

=> file f1-f10  
COST IN U.S. DOLLARS

SINCE FILE	TOTAL
ENTRY	SESSION
4.56	4.77

FULL ESTIMATED COST

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FILE 'LIFESCI' ENTERED AT 20:18:49 ON 05 NOV 2004  
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=> s (geranylgeranyl? (s)(synthas? or synthetas?)) and ((abietadien? or diterpen?)(s)(synthas? or synthetas?))  
L2 720 (GERANYLGERANYL? (S)(SYNTHAS? OR SYNTHETAS?)) AND ((ABIETADIEN? OR DITERPEN?)(S)(SYNTHAS? OR SYNTHETAS?))

=> s l2 and hmg?  
L3 283 L2 AND HMG?

=> dup rem l3  
DUPLICATE IS NOT AVAILABLE IN 'DGENE'.  
ANSWERS FROM THESE FILES WILL BE CONSIDERED UNIQUE  
PROCESSING COMPLETED FOR L3  
L4 282 DUP REM L3 (1 DUPLICATE REMOVED)

=> s l4 and (produc? or synthes?)  
6 FILES SEARCHED...  
L5 282 L4 AND (PRODUC? OR SYNTHES?)

=> s l5 and (microorganism? or cell? or organism? or yeast? or cerevis? or coli?)

1 FILES SEARCHED...  
5 FILES SEARCHED...  
7 FILES SEARCHED...  
L6 281 L5 AND (MICROORGANISM? OR CELL? OR ORGANISM? OR YEAST? OR CEREV  
IS? OR COLI?)

=> s l6 and upc?  
L7 1 L6 AND UPC?

=> d ti l6 1-281

L6 ANSWER 1 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 2 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 3 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 4 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 5 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 6 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 7 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 8 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 9 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 10 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.





diterpenes and diterpene precursors.

L6 ANSWER 35 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 36 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 37 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 38 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 39 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene precursors**.

L6 ANSWER 40 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

ANSWER 41 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 42 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 43 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

ANSWER 44 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

ANSWER 45 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.



**diterpene synthase, useful for producing diterpenes and diterpene precursors.**

L6 ANSWER 47 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase, useful for producing diterpenes and diterpene precursors.**

L6 ANSWER 48 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase, useful for producing diterpenes and diterpene precursors.**

L6 ANSWER 49 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase, useful for producing diterpenes and diterpene precursors.**

L6 ANSWER 50 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase, useful for producing diterpenes and diterpene precursors.**

L6 ANSWER 51 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase, useful for producing diterpenes and diterpene precursors.**

L6 ANSWER 52 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase, useful for producing diterpenes and diterpene precursors.**

L6 ANSWER 53 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase, useful for producing diterpenes and diterpene precursors.**

L6 ANSWER 54 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase, useful for producing diterpenes and diterpene precursors.**

L6 ANSWER 55 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase, useful for producing diterpenes and diterpene precursors.**

L6 ANSWER 56 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase, useful for producing diterpenes and diterpene precursors.**

L6 ANSWER 57 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase, useful for producing diterpenes and diterpene precursors.**

L6 ANSWER 58 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids

encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 59 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 60 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 61 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 62 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 63 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 64 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 65 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 66 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 67 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 68 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 69 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 70 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN





L6 ANSWER 94 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 95 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 96 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 97 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 98 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 99 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 100 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 101 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 102 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 103 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 104 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 105 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing**

**diterpenes and diterpene precursors.**

- L6 ANSWER 106 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene precursors**.
- L6 ANSWER 107 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene precursors**.
- L6 ANSWER 108 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene precursors**.
- L6 ANSWER 109 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene precursors**.
- L6 ANSWER 110 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
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- L6 ANSWER 111 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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- L6 ANSWER 112 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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- L6 ANSWER 113 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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- L6 ANSWER 114 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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- L6 ANSWER 115 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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- L6 ANSWER 116 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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- L6 ANSWER 117 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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- L6 ANSWER 118 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.
- L6 ANSWER 119 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.
- L6 ANSWER 120 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.
- L6 ANSWER 121 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.
- L6 ANSWER 122 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.
- L6 ANSWER 123 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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- L6 ANSWER 124 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.
- L6 ANSWER 125 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.
- L6 ANSWER 126 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.
- L6 ANSWER 127 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.
- L6 ANSWER 128 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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- L6 ANSWER 129 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 130 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 131 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 132 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 133 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 134 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 135 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 136 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 137 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 138 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 139 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 140 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene precursors**.

L6 ANSWER 141 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN



TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 142 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 143 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 144 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 145 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 146 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 148 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 149 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 150 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 151 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 152 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
 TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

[illegible]



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L6 ANSWER 177 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 178 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
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L6 ANSWER 179 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
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L6 ANSWER 180 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
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L6 ANSWER 181 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
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L6 ANSWER 182 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
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L6 ANSWER 183 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 184 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 185 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 186 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 187 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 188 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 201 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 202 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 203 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 204 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 205 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
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L6 ANSWER 206 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 207 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 208 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 209 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 210 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 211 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids encoding a **geranylgeranyl** pyrophosphate and a **diterpene synthase**, useful for **producing diterpenes** and **diterpene** precursors.

L6 ANSWER 212 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN

[illegible]











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**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 272 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 273 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 274 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 275 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
TI New unicellular **organisms** comprising exogenous nucleic acids  
encoding a **geranylgeranyl** pyrophosphate and a  
**diterpene synthase**, useful for **producing**  
**diterpenes** and **diterpene** precursors.

L6 ANSWER 276 OF 281 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Metabolic engineering of enzymes for increased diterpene  
**production** in unicellular **organisms**

L6 ANSWER 277 OF 281 USPATFULL on STN  
TI Identification and characterization of plant genes

L6 ANSWER 278 OF 281 USPATFULL on STN  
TI Biosynthesis of amorpho-4,11-diene

L6 ANSWER 279 OF 281 USPATFULL on STN  
TI Biosynthesis of isopentenyl pyrophosphate

L6 ANSWER 280 OF 281 USPATFULL on STN  
TI Method for modifying a biosynthetic pathway

L6 ANSWER 281 OF 281 USPATFULL on STN  
TI Directed evolution of biosynthetic and biodegradation pathways

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L7 ANSWER 1 OF 1 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Metabolic engineering of enzymes for increased diterpene  
**production** in unicellular **organisms**

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L6 ANSWER 1 OF 281 DGENE COPYRIGHT 2004 The Thomson Corp on STN  
ACCESSION NUMBER: ADM98884 protein DGENE  
TITLE: New unicellular **organisms** comprising exogenous  
nucleic acids encoding a **geranylgeranyl**  
pyrophosphate and a **diterpene synthase**,  
useful for **producing diterpenes** and  
**diterpene** precursors.  
INVENTOR: Matsuda S P T; Hart E A  
PATENT ASSIGNEE: (MATS-I)MATSUDA S P T.  
(HART-I) HART E A.  
PATENT INFO: US 2004072323 A1 20040415 38p  
APPLICATION INFO: US 2002-41018 20020107  
PRIORITY INFO: US 2001-259880P 20010105  
DOCUMENT TYPE: Patent

LANGUAGE: English  
OTHER SOURCE: 2004-373921 [35]  
DESCRIPTION: HMG-CoA reductase polypeptide #137.

AN ADM98884 protein DGENE

AB The invention relates to a unicellular **organism** for **producing a diterpene or diterpene precursor** comprising an exogenous nucleic acid sequence encoding a **geranylgeranyl pyrophosphate synthase** under the control of a promoter operable in the **organism**, and an exogenous nucleic acid sequence encoding a **diterpene synthase** under the control of a promoter operable in the **organism**. The invention also relates to methods of **producing a diterpene or diterpene precursor** and a method of isolating a **diterpene synthase** comprising growing several **cells** in the presence of a polyaromatic resin to make a **cell/resin mixture**, where at least one of the **cells** further comprises at least one isolated and purified nucleic acid sequence of a **yeast** expression library, and the expression of the nucleic acid sequence is regulated by an inducible promoter under conditions where the expression is induced, filtering the **cell/resin mixture**, extracting the **cell/resin mixture** with alcohol to **produce** an organic eluent and analysing the organic eluent by a screening method including chromatography and/or spectroscopy, to identify the nucleic acid sequence encoding the **diterpene synthase**. The unicellular **microorganism** is useful as a **diterpene or diterpene precursor producing** system. **Diterpenes**, in plants, serve as defence toxins, volatile defensive signals, pollinator attractants and photoprotectants. This sequence represents an **HMG-CoA reductase polypeptide** used in the scope of the invention. Note: The sequence data for this patent did not form part of the printed specification but was obtained in electronic format from USPTO at [seqdata.uspto.gov/sequence.html](http://seqdata.uspto.gov/sequence.html).

L6 ANSWER 276 OF 281 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 2004:310772 CAPLUS  
DOCUMENT NUMBER: 140:333562  
TITLE: Metabolic engineering of enzymes for increased diterpene **production** in unicellular **organisms**  
INVENTOR(S): Matsuda, Seiichi P. T.; Hart, Elizabeth A.  
PATENT ASSIGNEE(S): USA  
SOURCE: U.S. Pat. Appl. Publ., 38 pp.  
CODEN: USXXCO  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004072323	A1	20040415	US 2002-41018	20020107
PRIORITY APPLN. INFO.:			US 2001-259880P	P 20010105

AB The present invention is directed to a unicellular **organism** system, such as a **yeast**, for **producing geranylgeranyl pyrophosphate** and a diterpene in vivo. The **yeast cell** preferably comprises an inducible nucleic acid sequence encoding **geranylgeranyl pyrophosphate synthase**, an inducible nucleic acid sequence encoding a sol. form of **HMG-CoA reductase**, a nucleic acid sequence of an allele that confers an increase in sterol metabolic flux and, in the **diterpene-producing cell**, a **diterpene synthase**. In one embodiment, a haploid *Saccharomyces cerevisiae* strain **produces** significant yields of diterpene and diterpene precursors and is particularly useful as a prodn. mechanism for these compds. Wild-type **yeast** is transformed with a nucleic acid sequences encoding *Abies grandis abietadiene synthase* and/or *S. cerevisiae geranylgeranyl diphosphate synthase* (BTS1), and increaseing metaboic flux through the sterol biosynthetic pathway by transformation with with *S. cervisiae* or *Arabidopsis thaliana* **HMG-CoA reductase**. The upc2-1 allele is also incorporated to indirectly effect the metabolic flux of sterol bioxyntesis and provide

for an increased prodn. of geranylgeranyl diphosphate, geranylgeraniol, and diterpene.

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SEA (GERANYLGERANYL? (S)(SYNTHAS? OR SYNTHETAS?)) AND ((ABIETAD

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13 FILE AGRICOLA  
3 FILE BIOENG  
29 FILE BIOSIS  
6 FILE BIOTECHABS  
6 FILE BIOTECHDS  
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2 FILE WPIDS  
2 FILE WPINDEX

L1 QUE (GERANYLGERANYL? (S)(SYNTHAS? OR SYNTHETAS?)) AND ((ABIETAD  
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FILE 'DGENE, CAPLUS, USPATFULL, SCISEARCH, BIOSIS, ESBIODASE, EMBASE, MEDLINE, BIOTECHNO, LIFESCI' ENTERED AT 20:18:49 ON 05 NOV 2004

L2 720 S (GERANYLGERANYL? (S)(SYNTHAS? OR SYNTHETAS?)) AND ((ABIETADIE  
L3 283 S L2 AND HMG?  
L4 282 DUP REM L3 (1 DUPLICATE REMOVED)  
L5 282 S L4 AND (PRODUC? OR SYNTHES?)  
L6 281 S L5 AND (MICROORGANISM? OR CELL? OR ORGANISM? OR YEAST? OR CE  
L7 1 S L6 AND UPC?

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COST IN U.S. DOLLARS

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ENTRY	SESSION
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FULL ESTIMATED COST

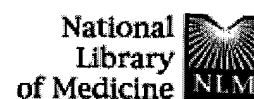
DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

SINCE FILE	TOTAL
ENTRY	SESSION
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**Pleiotropic mutations in *Saccharomyces cerevisiae* affecting sterol uptake and metabolism.****Lewis TL, Keesler GA, Fenner GP, Parks LW.**

Department of Microbiology, North Carolina State University, Raleigh 2769.

Sterol uptake control mutants (*upc*<sup>-</sup>) have been isolated via ethylmethanesulf mutagenesis from wild-type *Saccharomyces cerevisiae*. These mutants are hemolysis competent but possess the ability to accumulate exogenous sterol(s) under aerobic conditions. Previous studies demonstrate sterol uptake only in a hemolysis background; however, the *Upc*<sup>-</sup> strains described here are Hem<sup>+</sup> and do not require exogenous sterol for growth. We were unable to obtain viable hem<sup>+</sup>, erg<sup>-</sup>, *upc*<sup>-</sup> recombinants; such combinations appear to be lethal. Isolates of *Upc*<sup>-</sup> mutants demonstrated different levels of sterol uptake, and sterol analysis revealed a large phenotypic range with regard to amounts and accumulation of ergosterol and ergosterol sterols. Assays of acyl CoA: ergosterol acyltransferase and sterol 6-hydroxylase showed no apparent difference in activity between *Upc*<sup>-</sup> mutants and wild type.

PMID: 3059715 [PubMed - indexed for MEDLINE]

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<u>L6</u>	(4683202 or 4879236 or 5429939 or 5589581 or 5871986 or 5925565 or 5928906 or 5935819).pn.	8	<u>L6</u>
<u>L5</u>	(4683202 or 4879236 or 5429939 or 5589581 or 5871986 or 5925565 or 5928906 or 5935819)pn.	4713	<u>L5</u>
	<i>DB=PGPB,USPT,EPAB,JPAB,DWPI; PLUR=YES; OP=OR</i>		
<u>L4</u>	(diterpen\$4 or abietadie\$4) and ((geranylgeranyl\$4 same synthas\$4) or ggpp\$4) and ((diterpen\$4 same synthas\$4) or (abietadien\$4 same synthas\$4))	49	<u>L4</u>
<u>L3</u>	L1 and hmg\$6	8	<u>L3</u>
<u>L2</u>	L1 and (matsuda or hart).in.	3	<u>L2</u>
<u>L1</u>	(diterpen\$4 or abietadie\$4) same ((geranylgeranyl\$4 same synthas\$4) or ggpp\$4) same ((diterpen\$4 same synthas\$4) or (abietadien\$4 same synthas\$4))	46	<u>L1</u>



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☐ 1. Document ID: US 20040072323 A1

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L2: Entry 1 of 3

File: PGPB

Apr 15, 2004

PGPUB-DOCUMENT-NUMBER: 20040072323

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040072323 A1

TITLE: Diterpene-producing unicellular organism

PUBLICATION-DATE: April 15, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
<u>Matsuda</u> , Seiichi P.T.	Houston	TX	US	
<u>Hart</u> , Elizabeth A.	Houston	TX	US	

US-CL-CURRENT: [435/252.3](#); [435/155](#), [435/166](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 2. Document ID: US 20020164736 A1

L2: Entry 2 of 3

File: PGPB

Nov 7, 2002

PGPUB-DOCUMENT-NUMBER: 20020164736

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020164736 A1

TITLE: Ginkgo biloba levopimaradiene synthase

PUBLICATION-DATE: November 7, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
<u>Matsuda</u> , Seiichi P.T.	Houston	TX	US	
Schepmann, Hala G.	Talent	OR	US	

US-CL-CURRENT: [435/183](#); [435/252.33](#), [435/254.2](#), [435/320.1](#), [536/23.2](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 3. Document ID: US 20040072323 A1

L2: Entry 3 of 3

File: DWPI

Apr 15, 2004

DERWENT-ACC-NO: 2004-373921

DERWENT-WEEK: 200435

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TITLE: New unicellular organisms comprising exogenous nucleic acids encoding a geranylgeranyl pyrophosphate and a diterpene synthase, useful for producing diterpenes and diterpene precursors

INVENTOR: HART, E A; MATSUDA, S P T

PRIORITY-DATA: 2001US-259880P (January 5, 2001), 2002US-0041018 (January 7, 2002)

## PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
US 20040072323 A1	April 15, 2004		038	C12N001/20

INT-CL (IPC): C12 N 1/20; C12 P 5/00; C12 P 7/02

Full	Title	Citation	Front	Review	Classification	Date	Reference	Attachments	Claims	KMC	Draw D
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L1 and (matsuda or hart).in.	3

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☐ 1. Document ID: US 20040072323 A1

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L3: Entry 1 of 8

File: PGPB

Apr 15, 2004

PGPUB-DOCUMENT-NUMBER: 20040072323

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040072323 A1

TITLE: Diterpene-producing unicellular organism

PUBLICATION-DATE: April 15, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Matsuda, Seiichi P.T.	Houston	TX	US	
Hart, Elizabeth A.	Houston	TX	US	

US-CL-CURRENT: 435/252.3; 435/155, 435/166

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Drawings
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☐ 2. Document ID: US 20040010815 A1

L3: Entry 2 of 8

File: PGPB

Jan 15, 2004

PGPUB-DOCUMENT-NUMBER: 20040010815

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040010815 A1

TITLE: Identification and characterization of plant genes

PUBLICATION-DATE: January 15, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Lange, B. Markus	San Diego	CA	US	
Ghassemian, Majid	Carlsbad	CA	US	
Briggs, Steven P.	Del Mar	CA	US	
Cooper, Bret	La Jolla	CA	US	
Glazebrook, Jane	San Diego	CA	US	
Goff, Stephen Arthur	Encinitas	CA	US	

Katagiri, Fumiaki	San Diego	CA	US
Kreps, Joel	Carlsbad	CA	US
Moughamer, Todd	San Diego	CA	US
Provart, Nicholas	Toronto	CA	CA
Ricke, Darrell	San Diego	CA	US
Zhu, Tong	San Diego		US

US-CL-CURRENT: 800/278; 435/193, 435/419, 536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 3. Document ID: US 20040005678 A1

L3: Entry 3 of 8

File: PGPB

Jan 8, 2004

PGPUB-DOCUMENT-NUMBER: 20040005678

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040005678 A1

TITLE: Biosynthesis of amorpho-4,11-diene

PUBLICATION-DATE: January 8, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Keasling, Jay	Berkeley	CA	US	
Martin, Vincent	Kensington	CA	US	
Pitera, Douglas	Oakland	CA	US	
Withers, Sydnor T. III	Richmond	CA	US	
Newman, Jack	Berkeley	CA	US	

US-CL-CURRENT: 435/146; 435/193, 435/252.3, 435/320.1, 536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 4. Document ID: US 20030148479 A1

L3: Entry 4 of 8

File: PGPB

Aug 7, 2003

PGPUB-DOCUMENT-NUMBER: 20030148479

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030148479 A1

TITLE: Biosynthesis of isopentenyl pyrophosphate

PUBLICATION-DATE: August 7, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
------	------	-------	---------	---------

Keasling, Jay	Berkeley	CA	US
Martin, Vincent	Kensington	CA	US
Pitera, Douglas	Berkeley	CA	US
Kim, Seon-Won	Jeongdong-myeon Sacheon	CA	KR
Withers, Sydnor T. III	Richmond	CA	US
Yoshikuni, Yasuo	Berkeley	CA	US
Newman, Jack	San Francisco	CA	US
Khlebnikov, Artem Valentinovich	Mountain View		US

US-CL-CURRENT: [435/131](#); [435/252.3](#), [435/320.1](#), [435/471](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 5. Document ID: US 20020142281 A1

L3: Entry 5 of 8

File: PGPB

Oct 3, 2002

PGPUB-DOCUMENT-NUMBER: 20020142281

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020142281 A1

TITLE: Method for modifying a biosynthetic pathway

PUBLICATION-DATE: October 3, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Broun, Pierre	San Mateo	CA	US	

US-CL-CURRENT: [435/4](#); [800/278](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 6. Document ID: US 20020051998 A1

L3: Entry 6 of 8

File: PGPB

May 2, 2002

PGPUB-DOCUMENT-NUMBER: 20020051998

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020051998 A1

TITLE: Directed evolution of biosynthetic and biodegradation pathways

PUBLICATION-DATE: May 2, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Schmidt-Dannert, Claudia	Shoreview	MN	US	
Arnold, Frances H.	Pasadena	CA	US	

US-CL-CURRENT: 435/7.1; 435/325, 435/410, 435/67

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMOC	Draw D
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☐ 7. Document ID: US 6727234 B2

L3: Entry 7 of 8

File: USPT

Apr 27, 2004

US-PAT-NO: 6727234

DOCUMENT-IDENTIFIER: US 6727234 B2

TITLE: Isoprenoid analog compounds and methods of making and use thereof

DATE-ISSUED: April 27, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Wiemer; David	Iowa City	IA		
Hohl; Raymond J.	Iowa City	IA		

US-CL-CURRENT: 514/129; 558/152, 558/155

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMOC	Draw D
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☐ 8. Document ID: US 6002071 A

L3: Entry 8 of 8

File: USPT

Dec 14, 1999

US-PAT-NO: 6002071

DOCUMENT-IDENTIFIER: US 6002071 A

TITLE: Transcriptional silencing elements and their binding factors

DATE-ISSUED: December 14, 1999

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Chappell; Joseph	Lexington	KY		
Newman; Jeffrey D.	Williamsport	PA		
Yin; Shaohui	Ardmore	OK		

US-CL-CURRENT: 800/298; 435/320.1, 435/419, 536/24.1, 800/278

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMOC	Draw D
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